WHAT IS CLAIMED IS:

1. A sensor for detecting a target matter, the sensor comprising:

a chemical sensitive layer operable to react when exposed to the target matter;

a piezoresistive material coupled to the chemical sensitive layer;

the chemical sensitive layer configured such that the reaction of the target matter with the chemical sensitive layer creates an interfacial tension at the interface of the chemical sensitive layer and the piezoresistive material that changes the electrical resistance of the piezoresistive material, but such that the reaction of the target matter with the chemical sensitive layer does not affect the bulk properties of the chemical sensitive layer enough to change the electrical resistance of the piezoresistive material; and

an electrical circuit coupled to the piezoresistive material operable to detect the change in the electrical resistance of the piezoresistive material due to the interfacial tension.

2. The sensor of Claim 1, wherein the electrical circuit is further operable to detect the rate of change in the electrical resistance of the piezoresistive material to determine the concentration of the target matter.

3. The sensor of Claim 1, wherein the electrical circuit is further operable to detect the rate of change in the electrical resistance of the piezoresistive material to determine the type of target matter.

4. The sensor of Claim 1, wherein the chemical sensitive layer has a thickness thin enough such that adsorption of the target matter into the chemical sensitive layer creates a interfacial tension at the interface of the chemical sensitive layer and the piezoresistive material.

5. The sensor of Claim 1, wherein the chemical sensitive layer has a thickness thick enough such that the target matter does not affect the bulk properties of the chemical sensitive layer enough to change the electrical resistance of the piezoresistive material.

6. The sensor of Claim 1, wherein the chemical sensitive layer is configured such that the reaction of the target matter with the chemical sensitive layer does not change the dimensions of the chemical sensitive layer.

7. The sensor of Claim 1, wherein the chemical sensitive layer is a mono-layer.

8. The sensor of Claim 1, wherein the electrical circuit comprises a Wheatstone bridge.

9. The sensor of Claim 8, wherein the Wheatstone bridge comprises at least two resistors, the piezoresistive material and a variable resistor.

10. The sensor of Claim 9, wherein the electrical circuit further comprises a digital signal processor operable to dynamically vary the electrical resistance of the variable resistor to match the resistance of the piezoresistive material.

11. The sensor of Claim 1, wherein the target matter comprises mercury and the chemical sensitive layer comprises gold.

12. The sensor of Claim 1, wherein the target matter comprises a volatile organic compound and the chemical sensitive layer comprises photoresist.

13. A sensor for detecting a target matter, the sensor comprising:

a cantilevered beam having one or more piezoresistive regions disposed thereon;

each piezoresistive region comprising a piezoresistive material having an electrical resistance;

a chemical sensitive layer coupled to at least one of the piezoresistive regions;

the chemical sensitive layer configured such that the reaction of the target matter with the chemical sensitive layer creates an interfacial tension at the interface of the chemical sensitive layer and one or more of the piezoresistive regions that changes the electrical resistance of the piezoresistive regions, but such that the reaction of the target matter with the chemical sensitive layer does not affect the bulk properties of the chemical sensitive layer enough to change the electrical resistance of the piezoresistive regions; and

an electrical circuit coupled to the piezoresistive regions and operable to detect the change in the electrical resistance of one or more of the piezoresistive regions due to the interfacial tension.

14. The sensor of Claim 13, wherein the electrical circuit is further operable to detect the rate of change in the electrical resistance of the piezoresistive material to determine the concentration of the target matter.

15. The sensor of Claim 13, wherein the electrical circuit is further operable to detect the rate of change in the electrical resistance of the piezoresistive material to determine the type of target matter.

16. The sensor of Claim 13, wherein the cantilevered beam comprises a generally "U"-shaped double beam configuration.

17. The sensor of Claim 13, further comprising a second cantilevered beam having at least one piezoresistive region coupled to the electrical circuit in such a manner as to eliminate common mode noise and interfering effects.

18. The sensor of Claim 13, wherein the chemical sensitive layer has a thickness thin enough such that adsorption of the target matter into the chemical sensitive layer creates an interfacial tension at the interface of the chemical sensitive layer and one or more of the piezoresistive regions.

19. The sensor of Claim 13, wherein the chemical sensitive layer has a thickness thick enough such that the target matter does not affect the bulk properties of the chemical sensitive layer enough to change the electrical resistance of the piezoresistive regions.

20. The sensor of Claim 13, wherein the chemical sensitive layer is configured such that the reaction of the target matter with the chemical sensitive layer does not change the dimensions of the chemical sensitive layer.

21. The sensor of Claim 13, wherein the chemical sensitive layer is a mono-layer.

22. The sensor of Claim 13, wherein the electrical circuit comprises a Wheatstone bridge.

23. The sensor of Claim 22, wherein the Wheatstone bridge comprises at least two resistors, the piezoresistive material and a variable resistor.

24. The sensor of Claim 23, wherein the electrical circuit further comprises a digital signal processor operable to dynamically vary the electrical resistance of the variable resistor to match the resistance of the piezoresistive material.

25. The sensor of Claim 13, wherein the target matter comprises mercury and the chemical sensitive layer comprises gold.

26. The sensor of Claim 13, wherein the target matter comprises a volatile organic compound and the chemical sensitive layer comprises photoresist.

27. A method of detecting a target matter comprising:

forming a chemical sensitive layer selected to react when exposed to the target matter;

coupling the chemical sensitive layer to a piezoresistive material, the chemical sensitive layer configured such that the reaction of the target matter with the chemical sensitive layer creates an interfacial tension at the interface of the chemical sensitive layer and the piezoresistive material that changes the electrical resistance of the piezoresistive material, but such that the reaction of the target matter with the chemical sensitive layer does not affect the bulk properties of the chemical sensitive layer enough to change the electrical resistance of the piezoresistive material;

exposing the chemical sensitive layer to the target matter; and

detecting a change in the electrical resistance of the piezoresistive material due to the interfacial tension.

28. The method of Claim 27, further comprising correlating the measured change in resistance of the piezoresistive material with a corresponding concentration of the target matter.

29. The method of Claim 27, further comprising correlating the measured change in resistance of the piezoresistive material with a corresponding type of target matter.

30. The method of Claim 27, wherein the chemical sensitive layer is formed such that it has a thickness thin enough such that adsorption of the target matter into the chemical sensitive layer creates a interfacial tension at the interface of the chemical sensitive layer and the piezoresistive material.

31. The method of Claim 27, wherein the chemical sensitive layer is formed such that it has a thickness thick enough such that the target matter does not affect the bulk properties of the chemical sensitive layer enough to change the electrical resistance of the piezoresistive material.

32. The method of Claim 27, wherein the chemical sensitive layer is formed such that the reaction of the target matter with the chemical sensitive layer does not change the dimensions of the chemical sensitive layer.

33. The method of Claim 27, wherein the chemical sensitive layer is a mono-layer.

34. The method of Claim 27, wherein the change in electrical resistance is detected using a Wheatstone bridge.

35. The method of Claim 34, wherein the Wheatstone bridge comprises at least two resistors, the piezoresistive material and a variable resistor.

36. The method of Claim 35, further comprising dynamically varying the electrical resistance of the variable resistor to match the resistance of the piezoresistive material.